

Avago Technologies Docket No. 10004263-1

Listing of Claims

The following listing of claims replaces all prior versions.

- 1 1. (Previously presented) An apparatus for spectral dispersion
2 compensation in an optical communication network, comprising:
3 at least one optical medium having a signal distributed over a plurality of
4 wavelengths, a portion of the signal on each wavelength;
5 a demultiplexer adapted to receive the plurality of wavelengths and divide the
6 plurality of wavelengths into individual wavelengths, the individual wavelengths
7 relatively delayed by a respective dispersion compensation element, each dispersion
8 compensation element having a different delay characteristic to reduce inter-
9 wavelength spectral dispersion and to synchronize each portion of the signal with
10 respect to time across the plurality of wavelengths; and
11 a multiplexer adapted to receive each wavelength and combine the
12 wavelengths onto the optical medium.

- 1 2. (Original) The apparatus of claim 1, further comprising a dispersion
2 compensation element associated with each wavelength, the dispersion compensation
3 element configured to reduce inter-wavelength spectral dispersion.

- 1 3. (Original) The apparatus of claim 2, wherein the dispersion
2 compensation element is a Bragg grating.

- 1 4. (Original) The apparatus of claim 3, wherein the Bragg grating is a
2 fiber Bragg grating.

- 1 5. (Original) The apparatus of claim 3, wherein the Bragg grating is a
2 waveguide Bragg grating.

- 1 6. (Original) The apparatus of claim 1, wherein the multiplexer and the
2 demultiplexer are a surface diffraction grating.

1 7. (Original) The apparatus of claim 1, wherein the multiplexer and the
2 demultiplexer are an array waveguide (AWG).

1 8. (Original) The apparatus of claim 2, wherein the multiplexer and
2 demultiplexer are an array waveguide and the dispersion compensation elements are
3 waveguide Bragg gratings and the array waveguide and the waveguide Bragg gratings
4 are combined on a single optical substrate.

1 9. (Original) The apparatus of claim 1, wherein the optical network is an
2 optical code division multiple access (OCDMA) network and each wavelength
3 comprises information that represents a portion of the signal.

1 10. (Original) The apparatus of claim 2, wherein the dispersion
2 compensation element is located at an endpoint of the optical communication
3 network.

1 11. (Original) The apparatus of claim 2, wherein the dispersion
2 compensation element correlates the portion of the signal on each wavelength with
3 respect to time.

1 12. (Original) The apparatus of claim 1, wherein the multiplexer and the
2 demultiplexer are a single element.

1 13. (Previously presented) A method for spectral dispersion compensation
2 in an optical network, comprising:

3 supplying a signal distributed over a plurality of wavelengths to a
4 demultiplexer;

5 dividing the plurality of wavelengths into individual wavelengths;

6 simultaneously altering the relative timing among the wavelengths using a
7 dispersion compensation element associated with each wavelength, each dispersion
8 compensation element having a different delay characteristic, to reduce inter-

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9 wavelength spectral dispersion and to synchronize the distributed signal with respect
10 to time across the plurality of wavelengths; and
11 combining each wavelength onto an optical medium.

1 14. (Original) The method of claim 13, wherein the altering step is
2 performed by a Bragg grating.

1 15. (Original) The method of claim 14, further comprising the steps of:
2 forming the demultiplexer as an array waveguide; and
3 forming the dispersion compensation elements as waveguide Bragg gratings.

1 16. (Original) The method of claim 15, further comprising the step of
2 forming the demultiplexer and the dispersion compensation elements on a single
3 optical substrate.

1 17. (Original) The method of claim 13, wherein the optical network is an
2 optical code division multiple access (OCDMA) network and each wavelength
3 comprises information that represents a portion of the signal.

1 18. (Original) The method of claim 13, wherein the step of simultaneously
2 altering the timing of each wavelength is performed at one end of the optical
3 communication network.

1 19. (Original) The method of claim 13, wherein the step of simultaneously
2 altering the timing of each wavelength correlates each signal portion with respect to
3 time.

1 20. (Previously presented) An apparatus for spectral dispersion
2 compensation in an optical network, comprising:
3 means for supplying a signal distributed over a plurality of wavelengths to a
4 demultiplexer;
5 means for dividing the plurality of wavelengths into individual wavelengths;

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6 means for simultaneously altering the relative timing of the wavelengths, each
7 means having a different delay characteristic, to reduce inter-wavelength dispersion
8 and to synchronize the distributed signal with respect to time across the plurality of
9 wavelengths; and
10 means for combining each wavelength onto an optical medium.

1 21. (Original) The apparatus of claim 20, wherein the means for
2 simultaneously altering the timing of each wavelength is performed by a dispersion
3 compensation element associated with each wavelength.

1 22. (Original) The apparatus of claim 21, further comprising:
2 means for forming the demultiplexer as an array waveguide; and
3 means for forming the dispersion compensation elements as waveguide Bragg
4 gratings.

1 23. (Original) The apparatus of claim 22, further comprising means for
2 forming the demultiplexer and the dispersion compensation elements on a single
3 optical substrate.

1 24. (Original) The apparatus of claim 20, wherein the optical network is an
2 optical code division multiple access (OCDMA) network and each wavelength
3 comprises information that represents a portion of the signal.

1 25. (Original) The apparatus of claim 20, wherein the means for
2 simultaneously altering the relative timing of each wavelength operates at one end of
3 the optical communication network.

1 26. (Original) The apparatus of claim 20, wherein the means for
2 simultaneously altering the relative timing of each wavelength correlates each signal
3 with respect to time.

1 27. (Previously presented) A spectral dispersion compensator for an optical
2 signal distributed over a plurality of wavelengths, the dispersion compensator
3 comprising:

4 a demultiplexer for spatially dividing an incoming optical signal according to
5 the wavelengths;

6 plural dispersion compensation elements for adjusting the relative timing of all
7 of the wavelengths concurrently, each dispersion compensation element having a
8 different characteristic, and for synchronizing the spatially divided optical signal with
9 respect to time across the plurality of wavelengths; and

10 a multiplexer for combining the wavelengths as adjusted into an outgoing
11 optical signal.

1 28. (Original) The spectral dispersion compensator of claim 27, further
2 comprising an optical coupler for coupling the incoming optical signal from a first
3 optical fiber to the demultiplexer and for coupling the outgoing optical signal from the
4 multiplexer into a second optical fiber.

1 29. (Original) The spectral dispersion compensator of claim 28, wherein
2 the optical coupler is an optical circulator.

1 30. (Original) The spectral dispersion compensator of claim 27, wherein
2 the optical signal is an optical code division multiple access signal.

1 31. (Previously presented) A method for spectral dispersion compensation
2 for an optical signal distributed over a plurality of wavelengths, the method
3 comprising the steps of:

4 spatially dividing an incoming optical signal according to the wavelengths;

5 adjusting the relative timing of all of the wavelengths concurrently using a
6 dispersion compensation element for each wavelength, each dispersion compensation
7 element having a different delay characteristic, and for synchronizing the spatially
8 divided optical signal with respect to time across the plurality of wavelengths; and

9 combining the wavelengths as adjusted into an outgoing optical signal.

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1 32. (Original) The method of claim 31, further comprising the steps of:
2 coupling the incoming optical signal from a first optical fiber to the
3 demultiplexer; and
4 coupling the outgoing optical signal from the multiplexer into a second optical
5 fiber.

1 33. (Original) The method of claim 31, wherein the optical signal is an
2 optical code division multiple access signal.

1 34. (Original) The method of claim 31, further comprising correcting for
2 spectral dispersion within each of the wavelengths.

1 35. (Previously presented) An optical device comprising:
2 demultiplexer means for spatially separating by wavelength encoded
3 components of
4 an optical-code division multiple access signal;
5 dispersion-correction means for introducing relative delays among the encoded
6 components, each dispersion-correction means having a different delay characteristic,
7 to yield dispersion-corrected and temporally synchronized encoded components across
8 a plurality of wavelengths; and
9 multiplexer means for spatially combining the dispersion-corrected encoded
10 components.

1 36. (Original) The optical device of claim 35, wherein the dispersion
2 correction means corrects for dispersion within each of the encoded components.

1 37. (Original) The optical device of claim 36, wherein the dispersion-
2 correction means includes Bragg gratings corresponding to respective ones of the
3 encoded components.

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1 38. (Original) The optical device of claim 37, further comprising a
2 multiplexer serving as both the multiplexer means and the demultiplexer means.

1 39. (Original) The optical device of claim 38, further comprising a
2 monolithic structure including the multiplexer and the Bragg gratings.